Amendments to the Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (Currently Amended) A fibrous nanocarbon characterized by carbon hexagonal plane or stacking thereof, having ~~one or both~~ two directional growth axis to grow two units of carbon nanofibers, whereby; (1) the sp^2hybrid carbon content of more than 95% per total content; (2) the interlayer spacing d_{002}, d-spacing of C(002) profiles determined by X-ray diffraction method) of 0.3360 nm[[~]] to 0.3800 nm; (3) the (002) plane stacking of more than 4 layers and the aspect ratio of more than 20; (4) the fiber cross-section width/thickness of 2.0 nm[[~]] to 800 nm; (5) the inclination angle of hexagonal plane alignment for each composed carbon nanofibers to the fiber axis of 0[[~]] to 85 degrees; and carbon hexagonal planes stacking along the fiber axis, forming knots (nodes) at intervals of 5 nm[[~]] to 100 nm, sharing partly the structure or stacking layers in carbon hexagonal planes of each composed carbon nanofibers and connecting periodically to each other, consequently forming ladder-like structure with open parts between each connection units, through which the inner side of the fibrous nanocarbon is open and connected to the outer space,

wherein the carbon hexagonal planes align angled to the fibrous nanocarbon axis, and the two unit carbon nanofibers are combined by inter-fiber force or van der walls force, forming pair structure as a single body.

2. (Currently Amended) A fibrous nanocarbon characterized by carbon hexagonal plane or stacking thereof, having ~~one or both~~ two directional growth axis to grow two units of carbon nanofibers, whereby; (1) the sp^2 hybrid carbon content of more than 95% per total content; (2) the interlayer spacing d_{002}, d-spacing of C(002) profiles determined by X-ray diffraction method) of 0.3360 nm[[~]] to 0.3800 nm; (3) the (002) plane stacking of more than 8 layers; (4) the width/thickness of fiber cross-section of 2.0 nm[[~]] to 800 nm; (5) the aspect ratio is more than 20; and (6) bonding of two unit carbon nanofibers with said (1)[[~]] to (5) features at 0.5 nm~30 nm distance by the inter-fiber force between the two unit fibers from the beginning of fiber formation,

wherein the carbon hexagonal planes align angled to the fibrous nanocarbon axis, and the two unit carbon nanofibers are combined by inter-fiber force or van der walls force, forming pair structure as a single body.

3. (Currently Amended) A preparation method of fibrous nanocarbon ~~according to~~ of claim 1 through catalytic pyrolysis of gaseous or liquid carbon sources, wherein said catalyst is unsupported bulk metal or particulate metal, and said bulk metal or particulate metal are reduced and simultaneously formed into very fine metal particles by hydrogen or hydrogen radical during the catalyst reduction process,

wherein the catalyst is prepared by the steps comprising of: preparing an alloy of primary metal and secondary metal; reducing the alloy to form an alloy-catalyst; cooling the alloy-catalyst for passivation; reducing the cooled alloy-catalyst at the temperature ranges of 450~550°C under the hydrogen-helium mixed gases containing 1~40v/v % hydrogen; and reacting the reduced alloy-catalyst with the gaseous or liquid carbon sources.

4. (Currently Amended) A preparation method of fibrous nanocarbon ~~according to~~of claim 2 through catalytic pyrolysis of gaseous or liquid carbon sources, wherein said catalyst is unsupported bulk metal or particulate metal, and said bulk metal or particulate metal are reduced and simultaneously formed into very fine metal particles by hydrogen or hydrogen radical during the catalyst reduction process,

wherein the catalyst is prepared by the steps comprising of: preparing an alloy of primary metal and secondary metal; reducing the alloy to form an alloy-catalyst; cooling the alloy-catalyst for passivation; reducing the cooled alloy-catalyst at the temperature ranges of 450~550°C under the hydrogen-helium mixed gases containing 1~40v/v % hydrogen; and reacting the reduced alloy-catalyst with the gaseous or liquid carbon sources.

5. (Currently Amended) [[A]] The preparation method according to claim 3, wherein transition metals such as Fe, Ni or Co active to said carbon sources are used as primary metals; to assist dispersion of said primary metals, the addition of 5 [[~]]to 95 wt % secondary metals inactive to said carbon sources results in formation of fine particle catalyst; and

hydrocarbon/hydrogen gas mixtures containing 2 [[~]]to 95v/v % hydrogen are introduced at the rate of 0.5 [[~]]to 30 sccm per 1 mg catalyst at the temperatures of 380 [[~]]to 750℃ for the reaction time of 2 min [[~]]to 48 h over said fine particle catalyst.

6. (Currently Amended) [[A]] The preparation method according to claim 4, wherein transition metals such as Fe, Ni or Co active to said carbon sources are used as primary metals; to assist dispersion of said primary metals, the addition of 5 [[~]]to 95 wt % secondary metals inactive to said carbon sources results in formation of fine particle catalyst; and hydrocarbon/hydrogen gas mixtures containing 2 [[~]]to 95 v/v % hydrogen are introduced at the rate of 0.5 [[~]]to 30 sccm per 1 mg catalyst at the temperatures of 380 [[~]]to 750℃ for the reaction time of 2 min [[~]]to 48 h over said fine particle catalyst.

7. (Currently Amended) [[A]] The preparation method according to claim 5, wherein said catalyst contains 5 [[~]]to 95 wt % composition ratio of said primary metals and secondary metals.

8. (Currently Amended) [[A]] The preparation method according to claim 6, wherein said catalyst contains 5 [[~]]to 95 wt % composition ratio of said primary metals and secondary metals.

9. (Currently Amended) A fibrous nanocarbon characterized by carbon hexagonal plane or stacking thereof, having ~~one or both~~ two directional growth axis to grow two units of carbon nanofibers, whereby; (1) more than 95 wt % of carbon content; (2) 5.5 [[~]]to 550 nm fiber diameters; (3) the aspect ratio of more than 10; and (4) ~~and~~ carbon hexagonal planes stacking along the fiber axis, forming knots at regular intervals sharing partly the structure or stacking layers in carbon hexagonal planes of each composed carbon nanofibers and connecting periodically to each other, forming open parts between each connection units through which the inner side of the fibrous nanocarbonis open and connected to the outer space with no continuous hollow core in the inner space of said fibrous nanocarbon,

wherein the carbon hexagonal planes align angled to the fibrous nanocarbon axis, and the two unit carbon nanofibers are combined by inter-fiber force or van der walls force, forming pair structure as a single body.

10. (Currently Amended) A fibrous nanocarbon characterized by carbon hexagonal plane or stacking thereof, having ~~one or both~~ two directional growth axis to grow two units of carbon nanofibers, whereby; (1) more than 95 wt % of carbon content; (2) 5.5 [[~]]to 550 nm fiber diameters; (3) the aspect ratio of more than 10, and bonding of two unit carbon nanofibers with no continuous hollow core in the inner space of said fibrous nanocarbon,

wherein the carbon hexagonal planes align angled to the fibrous nanocarbon axis, and the two unit carbon nanofibers are combined by inter-fiber force or van der walls force, forming pair structure as a single body.

11. (Currently Amended) A preparation method of fibrous nanocarbon ~~according to~~of claim 1 through catalytic pyrolysis of gaseous or liquid carbon sources, wherein iron catalyst or iron-alloy catalysts are used as production catalyst wherein iron is a primary metal catalyst, and nickel, cobalt, manganese, and molybdenum are secondary metals for dispersion of said primary metal; and carbon monoxide/hydrogen gas mixtures containing 0 [[~]] 25v/v % hydrogen are introduced at the rate of 0.5 [[~]] 30 sccm per 1 mg catalyst at the temperatures of 400 [[~]] 700℃ for the reaction time of 2 min [[~]] 12 h over said production catalyst,

wherein catalyst is prepared by the steps comprising of: preparing an alloy of primary metal and secondary metal; reducing the alloy to form an alloy-catalyst; cooling the alloy-catalyst for passivation; reducing the cooled alloy-catalyst at the temperature ranges of 450~550°C under the hydrogen-helium mixed gases containing 1~40v/v % hydrogen; and reacting the reduced alloy-catalyst with the gaseous or liquid carbon sources.

12. (Currently Amended) A preparation method of fibrous nanocarbon ~~according to~~of claim 9 through catalytic pyrolysis of gaseous or liquid carbon sources, wherein iron catalyst or iron-alloy catalysts are used as production catalyst wherein iron is a primary metal catalyst, and nickel, cobalt, manganese, and molybdenum are secondary metals for dispersion of said primary

metal; and carbon monoxide/hydrogen gas mixtures containing 0 [[~]]to 25v/v % hydrogen are introduced at the rate of 0.5 [[~]]to 30 sccm per 1 mg catalyst at the temperatures of 400 [[~]]to 700℃ for the reaction time of 2 min ~ 12 h over said production catalyst,

wherein catalyst is prepared by the steps comprising of: preparing an alloy of primary metal and secondary metal; reducing the alloy to form an alloy-catalyst; cooling the alloy-catalyst for passivation; reducing the cooled alloy-catalyst at the temperature ranges of 450~550°C under the hydrogen-helium mixed gases containing 1~40v/v % hydrogen; and reacting the reduced alloy-catalyst with the gaseous or liquid carbon sources.

13. (Currently Amended) A preparation method of fibrous nanocarbon ~~according to~~of claim 10 through catalytic pyrolysis of gaseous or liquid carbon sources, wherein iron catalyst or iron-alloy catalysts are used as production catalyst wherein iron is a primary metal catalyst, and nickel, cobalt, manganese, and molybdenum are secondary metals for dispersion of said primary metal; and carbon monoxide/hydrogen gas mixtures containing 0 [[~]]to 25 v/v % hydrogen are introduced at the rate of 0.5 [[~]]to 30 sccm per 1 mg catalyst at the temperatures of 400 [[~]]to 700℃ for the reaction time of 2 min [[~]]to 12 h over said production catalyst,

wherein catalyst is prepared by the steps comprising of: preparing an alloy of primary metal and secondary metal; reducing the alloy to form an alloy-catalyst; cooling the alloy-catalyst for passivation; reducing the cooled alloy-catalyst at the temperature ranges of 450~550°C under the hydrogen-helium mixed gases containing 1~40v/v % hydrogen and reacting the reduced alloy-catalyst with the gaseous or liquid carbon sources.

14. (Currently Amended) [[A]] The preparation method according to claim 11, wherein said alloy catalyst according to the alloy kind is composed of 0/1.0 [[~]]to 0.8/0.2 (wt/wt) of Ni/Fe, and 0/1.0 [[~]]to 0.8/0.2 (wt/wt) of Co/Fe or Mn/Fe or Mo/Fe.

15. (Currently Amended) [[A]] The preparation method according to claim 12, wherein said alloy catalyst according to the alloy kind is composed of 0/1.0 [[~]]to 0.8/0.2 (wt/wt) of Ni/Fe, and 0/1.0 [[~]]to 0.8/0.2 (wt/wt) of Co/Fe or Mn/Fe or Mo/Fe.

16. (Currently Amended) [[A]] The preparation method according to claim 13, wherein said alloy catalyst according to the alloy kind is composed of 0/1.0 [[~]]to 0.8/0.2 (wt/wt) of Ni/Fe, and 0/1.0 [[~]]to 0.8/0.2 (wt/wt) of Co/Fe or Mn/Fe or Mo/Fe.